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DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
2101 L STREET NW
WASHINGTON, DC 20037-1526

| EXAMINER | |
|---|---|
| MONDT, JOHANNES P | |

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| 2826 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/603,670 | CAMPBELL, KRISTY A. | |
| | Examiner | Art Unit | |
| | Johannes P Mondt | 2826 | |

*-- The MAILING DATE of this communication appears on the cover sheet with th c rrespondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

The filing on 6/23/03 of this Continuation of Parent Application with Serial Number 09/941,544 forms the basis of this Office Action. It is noted that the claims are identical to the claims in the Parent Application.

### *Specification*

1. Although the examiner does not insist on the replacement of the verbiage "glass forming region" because of its frequent appearance in the professional literature, the examiner urges Applicant to define said verbiage in the specification by inserting in brackets after it in section [0007] the following explanation: "i.e., the regime in the phase diagram in which glass can be formed", to avoid any confusion between the commonly understood meaning of "region" as a topographic delineation in real space and the present range delineation intended by Applicant.

### *Claim Objections*

2. ***Claim 1*** is objected to because of the following informality: the verbiage "maxium" should be replaced with "maximum". Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

***4.*** ***Claims 1-10*** are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, assuming the "maximum allowable amount of metal dopant" as cited in claim 1 the system state would have to be (a) away from the crystalline state by a finite distance in parameter space by virtue of the non-glass state at the transition point from the glass phase to the crystalline phase, and (b) be farther away from the transition point than that glass state that is twice as close to said transition point, which is in contradiction to the assumption.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. ***Claims 1-10*** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the limitation "maximum allowable" in line 3 of claim 1 is indefinite, because it is not specified which parameter or parameter set is available for selecting a maximum by optimization of the value of said parameter or parameter set, particularly, whether said maximum is to be determined for the particular stoichiometric parameter value so as to arrive at a stoichiometry-dependent maximum, or whether the stoichiometry itself should be varied as well so as to arrive at an overall maximum.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. ***Claim 11*** is rejected under 35 U.S.C. 102(b) as being anticipated by Kozicki et al (5,761,115). Kozicki et al teach a non-volatile cell (cf. claim 46 in Kozicki; cf. column 21, lines 17-19) comprising:

a germanium selenide glass 12 (cf. column 5, lines 45-50) doped with silver (cf. column 5, lines 13-31), said silver doping being in a concentration which maintains said germanium selenide glass in the glass forming region (inherently so, as the dendritic growth upon the application of an electric field (cf. column 5, lines 56-60) cannot otherwise occur, the resistivity of the bulk being too low in that case); a first electrode 13 and a second electrode 14 in contact with said doped germanium selenide glass (cf. column 5, lines 50-52); and

a dendrite formed between said first and second electrodes when voltage is applied to said first and second electrodes (cf. column 5, lines 56-60).

In conclusion, Kozicki et al anticipate claim 11.

1. ***Claims 17-23*** are rejected under 35 U.S.C. 102(b) as being anticipated by Mitkova et al (Phys. Rev. Lett. 83, 3848-3851 (1999)).

*With regard to claim 17,* Mitkova et al teach the synthesis of a chalcogenide glass having the formula $(Ge_{x1}Se_{1-x1})_{1-y1}Ag_{y1}$ wherein $18 \leq x_1 \leq 28$, in particular chalcogenide glass of such chemical constitution as defined by glass phase region I in Figure 1, which chemical constitution is obtained in a range, in this prior art, for x1 from 0 to about 0.3 (said range in the prior art depending on the silver content) that substantially overlaps with the claimed range, as witnessed from the presence of a glass state in the shaded area marked "I" (cf. p. 3848, first column, second paragraph and legend of Figure 1). It is noted that evidently the silver in glass phase I is of a concentration that maintains said germanium selenide glass to be in the "glass forming region", as otherwise said germanium selenide glass would not be in a glass phase and hence a forteriori not in glass phase I. In view of the substantial overlap of the claimed range and the prior art range, Mitkova et al anticipate claim 17.

*With regard to claim 18,* the width of said glass phase region I at the value x1=0.23 is finite, at a physical value of non-zero silver content (see Figure 1). Therefore, the prior art range overlaps with the range claimed in claim 18, and hence Mitkova et al anticipate claim 18.

*With regard to claim 19,* note the glass state represented by a square and corresponding to $x_1$=0.25 and a silver content defined by $y_1$= 0.25 in the terminology of the claim. Therefore, Mitkova et al anticipate claim 19.

*With regard to claim 20,* the width of said glass phase region I at the value x1=0.20 is finite, at a physical value of non-zero silver content (see Figure 1). Therefore, the prior art range overlaps with the range claimed in claim 20, and hence Mitkova et al anticipate claim 20.

*With regard to claim 21,* the set of parameter values implied by the numerical limitation as defined by claim 21 substantially overlaps with the glass forming region as can be determined from Figure 1 in Mitkova et al. Therefore, Mitkova et al anticipate claim 21.

*With regard to claim 22,* from Figure 1 in Mitkova et al, and its discussion on page 3848 in Mitkova et al, first column, second paragraph, the glass forming region II extends over germanium concentrations from about 38% to about 46% while being silver-doped $Ge_3Se_7$. In conclusion, Mitkova et al anticipate claim 22.

*With regard to claim 23,* the set of parameter values implied by the numerical limitation as defined by claim 23 substantially overlaps with the glass forming region as can be determined from Figure 1 in Mitkova et al.

## ***Double Patenting***

2. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in

scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

3. ***Claims 17-23*** of this application conflict with claims 17-23 of Application No. 10/356,634. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

### *Claim Rejections - 35 USC § 103*

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. ***Claims 1-3 and 5-10*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki (6,487,106 B1) in view of Mitkova et al (Phys. Rev. Lett. 83 (19), 3848-'51 (1999)).

Kozicki teaches a memory cell (cf. title, abstract and column 1, lines 20-60) comprising:

a chalcogenide glass 140 (cf. Figure 1) doped with a metal (cf. column 5, lines 12-52), said chalcogenide glass having a stoichiometry and an amount of metal dopant which causes said chalcogenide glass to remain in a glass phase;

a first electrode 120 and second electrode 130 in contact with said chalcogenide glass (cf. column 4, lines 13-44 and Figure 1); and

a dendrite (cf. column 4, lines 22-30, more specifically lines 32-33) formed between said first and second electrodes when a voltage is applied to said first and second electrodes.

*Kozicki does not necessarily teach* said amount of metal dopant to be the maximum allowable amount for said chalcogenide glass to remain in a glass-forming region. However, it is understood in the art that the very purpose of adding metal to the chalcogenide glass is to facilitate a sharp but reversible transition between high-resistivity and low-resistivity states enabled by the effect of metal, notably silver (Ag) as a network modifier or network forming agent, as witnessed by Mitkova et al, who teach the dual role of silver (Ag) as network modifying or network-former on chalcogenide glasses (cf. title and abstract, page 3848, column 1, line 8 of second paragraph – column 2, line 2; see also Figure 1, particularly glass forming regions I and II with glassy samples with solid dots indicated reaching up to the border of said glass forming regions I and II), whereby it is shown that a maximum amount of silver is found to be compatible with the glass forming region at $Ge_xSe_{1-x}$ with x=1/3, said maximum being approximately 30% (see Figure 1 and page 3850, second column, second paragraph).

*Motivation* to include the teaching in this regard by Mitkova et al in the invention by Kozicki is the shorter switching time and the reduction of power needed for the switching operation. *Combination* of the teaching is straightforward, because a specific prescription of the method of making is discussed (photodoping) in Mitkova et al (cf. page 3850, loc. cit.) that is also a method of making discussed by Kozicki (cf. column 6, lines 13-24). Thus, following the same method of making, *expectation of success* in the implementation of the aforementioned combination can be deemed reasonable.

*With regard to claim 2:* the photo-dissolution method taught by Kozicki (cf. column 6, lines 19-24) does not require the temperature to be raised above the glass transition temperature, whilst a rise above said transition temperature is an obvious disadvantage as the glass phase would have to be re-constituted.

*With regard to claims 3 and 7:* the chalcogenide glass in Kozicki can comprise selenium (cf. column 5, line 44).

*With regard to claim 5:* the chalcogenide glass in Kozicki can comprise sulfur (cf. column 5, line 44 and column 6, lines 13-29).

*With regard to claim 6:* the chalcogenide glass in Kozicki can comprise tellurium (cf. column 5, line 44).

*With regard to claim 8:* said metal in Kozicki is selected from a group comprising silver, copper, zinc and similar metals.

*With regard to claim 9:* said chalcogenide glass in Kozicki can be germanium selenide glass (cf. column 5, line 44).

*With regard to claim 10:* said chalcogenide glass in Kozicki can be silver-doped germanium selenide (cf. column 5, line 44).

11. ***Claim 4*** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki and Mitkova et al as applied to claim 3 above, and further in view of Samson et al (6,226,308 B1). As detailed above, claim 3 is unpatentable over Kozicki in view of Mitkova et al. Neither Kozicki nor Mitkova et al necessarily teach the further limitation of claim 4. However, it would have been obvious to include a small amount of oxygen through adding a metal oxide in the chalcogenide glass in order to render said chalcogenide glass more stable against devitrification, as exemplified by Samson et al (cf. column 2, lines 39-42).

*Motivation* to include the teaching by Samson et al in the invention essentially taught by Kozicki and Mitkova et al is to enable a more reliable manufacturing process of the glass phase. *Combination* of the invention is readily accomplished by following the method of making taught by Samson et al involving the addition of only minute amounts (0.01% by weight) of metal oxide (cf. column 3, lines 11-15 and column 4, lines 1-25). *Success* in the implementation of said combination can therefore be reasonably expected.

12. ***Claims 12 and 26*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki et al (5,761,115) in view of Kozicki (6,487,106 B1). As detailed above, Kozicki et al anticipate claim 11. Kozicki et al do not necessarily teach the further

limitation as defined by claim 12. However, as evidenced by Kozicki, column 6, lines 18-23, it is understood that photo-dissolution offers a method of making in which no temperature rise is needed in order to make the metal-doped chalcogenide. Since no thermal dissolution is involved in said method of making the temperature of the glass as final structure is not lower than the temperature during the process of its making. Because said temperature of said final structure is less than the glass transition temperature, said further limitation is met by Kozicki.

*Motivation* to include the method of making taught by Kozicki in the invention taught by Kozicki et al stems from the synergistic manner in which the insertion of the doping can be combined with the insertion of the electrode over the chalcogenide without the need for a thermal budget (cf. column 5, lines 53-64). Since at most only the route for introducing the silver has to be modified towards a less intrusive one (namely: to be changed from the thermal dissolution method to the photo-dissolution method), the teaching by Kozicki *combines* readily with the invention by Kozicki et al. *Success* in implementing the teaching by Kozicki can therefore be reasonably expected.

*With regard to claim 26:* the device of claim 12 would necessarily have to be formed in order to function, while for it to be made it is obvious to one of ordinary skills in the art that the highest temperature used in the formation using the above-described photo-dissolution method does not exceed the glass transition temperature. Claim 26 fails to further limit the device of claim 12 other than simply form each of the components of the non-volatile memory cell.

13. ***Claims 13-14 and 27-30*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki et al as applied to claim 11 above, in view of Kozicki et al (US 2002/0168820 A1). As detailed through Figure 1 in Mitkova et al, and its discussion on page 3848 in Mitkova et al, the glass-forming region I (Se-rich portion of said glass-forming region) extends over germanium concentrations from 0 to about 33%. The interval over which the art can be practiced is therefore well known to substantially overlap the range as defined in claim 13, while Kozicki (US 2002/0168820) (henceforth called Kozicki A1) has implemented this widely known knowledge in a microelectronic programmable memory device (cf. page 1, sections [0001] and [0002]) in which a silver-doped, selenium-rich (in claim 13 terminology x1 approximately equal to 20) germanium-selenide glass is used for the ion conductor 140 (cf. page 5, section [0060] and claim 15 of Kozicki_A1) in order to form a glass in which the mean coordination number (2.4) is close to the theoretically predicted maximum for stability against devitrification, which provides the *motivation* for inclusion of the teaching by Kozicki_A1 in the invention by Kozicki. *Combinability* of the inventions follows from the circumstance that the devices in Kozicki and Kozicki_A1 both are programmable microelectronic memory devices based on silver-doped selenium-germanium glass as the material for the ion conductor, while a specification method of forming the aforementioned material is disclosed by Kozicki_A1 (see sections [0058] and [0059] on page 5). *Success* in the implementation of the combination can therefore be reasonably expected.

*With regard to claim 14:* the set of parameter values implied by the numerical limitation as defined by claim 14 substantially overlaps with the glass forming region as can be determined from Figure 1 in Mitkova et al, while Kozicki_A1 discloses a silver content of between 0 and 34% (cf. page 11, claim 16 in Kozicki, section [0107]); this range substantially overlaps with Applicant's as described in claim 14. Redundantly, Applicant is reminded that it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

*With regard to claim 27:* The device of claim 13 would necessarily have to be formed in order to function. Claim 27 fails to further limit the device of claim 13 other than simply form each of their components and state obvious conditions for it in order to function, namely that at least two electrodes are needed to be in contact with said germanium selenide glass at locations that permit said germanium selenide glass to transition between high and low resistance states in response to signals applied to said electrodes.

*With regard to claims 28-30:* Applicant fails to show in the disclosure why the selected values for x1 are critical to the invention. Applicant is reminded that it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

14. ***Claim 15-16, 25, 31, 36 and 42-43*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki et al (5,761,115) as applied to claim 11 above, in view of Mitkova et al (Phys. Rev. Lett. 83 (19), 3848-'51 (1999) and Kozicki (6,487,106 B1).

As detailed above, claim 11 is anticipated by Kozicki et al. Kozicki et al do not necessarily claim the further limitation of claim 15. However, in view of Figure 1 in Mitkova et al, and its discussion on page 3848 in Mitkova et al, it is well known among those of ordinary skills that the glass forming region II extends over germanium concentrations from about 38% to about 46% while silver-doped $Ge_3Se_7$ and hence, in Applicant's terminology x2 approximately equal to 43, i.e., 43% germanium concentration within the germanium selenium glass are arguably the most widely studied and used; see, for instance Kozicki, column 8, lines 32-56. In conclusion, the interval over which the art can be practiced substantially overlaps the range as defined in claim 15 while the art certainly has been practiced in the field of programmable microelectronic memory devices very close to Applicant's range, within less than 1% away from it. Furthermore, Applicant is reminded that it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. In the present case, therefore, Applicant should have disclosed why the particular range as claimed is critical to the invention. The rationale given for said range in Applicant's disclosure, - namely: to avoid corridor 88 in Mitkova et al, is known to those of ordinary skills in the art, as said corridor lies outside the regime of the glass-forming phase ("glass-forming regions I and II"), while a mere avoidance of said corridor also would

allow the aforementioned silver-doped $Ge_3Se_7$ to be practiced, obviously with some margin to ensure being within the interior of said regime of the glass-forming phase.

*With regard to claim 16:* the set of parameter values implied by the numerical limitation as defined by claim 16 substantially overlaps with the glass forming region as can be determined from Figure 1 in Mitkova et al. Furthermore, Applicant is reminded that it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

*With regard to claim 25:* said germanium selenide glass in Kozicki et al is a component of a memory cell (cf. column 3, lines 43-50) wherein at least two electrodes 93 and 94 (cf. Figure 9B) (cf. column 16, lines 21-43) are in contact with said germanium selenide glass 92 (cf. column 16, line 27; see column 5, lines 32-45 for the material constitution of ion conductor in Kozicki et al), said germanium selenide glass forming a dendrite (cf. abstract) between at least two electrodes in response to a voltage across said at least two electrodes. Kozicki et al do not necessarily teach: (a) the range for the concentration of germanium relative to selenium in said germanium selenide glass, nor (b) the silver content as prescribed by Applicant's claim 25 so as to maintain said germanium selenide glass to be in the glass-forming region. However, it would have been obvious from Mitkova et al to select a range for said concentration of germanium and said silver content according to the prescription laid down by claim 25 in view of Figure 1 in Mitkova, which particularly illustrates a range in the parameter $x_2$ overlapping with the one as defined by Applicant in claim 25 in which the glass-forming

region can be maintained for a wide range of silver content values. Applicant in the disclosure does not show that the claimed range is critical to the invention. In view of this Applicant is reminded that it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

*With regard to claim 31:* the device of claim 25 would necessarily have to be formed in order to function. Claim 31 fails to further limit the device of claim 25 other than simply form each of their components.

*With regard to claim 36:* claim 36 merely states how the device of claim 25 is to be used (cf. column 3, lines 20-43 in Kozicki et al for the description as to said use).

*With regard to claim 42:* although Kozicki et al nor Mitkova et al necessarily specifically disclose said processor system comprising processor, and integrated circuit coupled to said processor including a memory cell, it is obvious and understood in the art that the very purpose of the memory cell by Kozicki et al is its use in memory systems, in which the memory cell by necessity is part of an integrated circuit coupled to a processor (cf. column 3, lines 12-17, in which the background of the invention is discussed in terms of the place of memory devices, necessarily including integrated circuits and processors).

*With regard to claim 43:* the examiner takes official notice that processors and integrated circuits can be manufactured on the same chip.

15. ***Claims 24 and 32*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki et al (US 2002/0168820), here called Kozicki_A1, in view of Kozicki et al (5,761,115). Kozicki_A1 teach a memory cell (cf. title and section [0002]) comprising:

a germanium selenide glass having the formula $(Ge_{x1}Se_{1-x1})_{1-y1}Ag_{y1}$ wherein $18 \leq x_1 \leq 28$ (cf. claim 15 in Kozicki_A1 and section [0060]) and wherein said silver is in a concentration (cf. claim 16) which maintains said germanium selenide glass in the glass-forming region; and

at least two electrodes 120 and 130 in contact with said germanium selenide glass (inert electrode 130 is in direct contact, abutting the ion conductor 140 comprising said germanium selenide glass, while silver electrode 120 is in contact with the ion conductor 140 through silver migration through barrier layer 155 (see section [0047]), said migration being at a reduced level in the OFF state but greatly enhanced in the ON state (see section [0047]), said germanium selenide glass inherently to a certain extent forming a dendrite between at least two electrodes in response to a voltage applied across said at least two electrodes, said dendrite being the inevitable response to the voltage in view of the composition of the ion conductor 140.

*Kozicki_A1 do not necessarily teach* the non-inert electrode also to be in direct contact; however, the invention by Kozicki_A1 is in this regard merely a further sophistication of the invention by Kozicki et al, where a more conventional design has electrodes 93 and 94 in direct contact with the chalcogenide glass of the ion conductor

92 (cf. Figure 9B and column 16, lines 30-44) in order to suppress undesirable levels of dendritic formation (in both design there is some dendrite formation).

*Motivation* to include the teaching in Kozicki et al is the cost saving achieved by falling back on the conventional design by omitting the barrier layer 155. *Combination* of the teachings is readily achieved by omitting the barrier layer 155. Success in implementing the aforementioned combination can therefore be reasonably expected.

*With regard to claim 32:* claim 31 merely states how the device of claim 24 is to be used (cf. sections [0037] – [0040] in Kozicki_A1).

16. ***Claims 33-35*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki (US 2002/0168820 A1) ("Kozicki_A1"). As detailed above, claim 32 is unpatentable over Kozicki_A1 in view of Kozicki et al, neither necessarily disclosing the further limitation as defined by claims 33-35. However, Applicant does not disclose why the selected values for the stoichiometric parameter are critical to the invention. Applicant is reminded that it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

17. ***Claims 37-41*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki (US 2002/0168820 A1) ("Kozicki_A1), or, in the alternative, over Kozicki (US 2002/0168820 A1) ("Kozicki_A1) in view of Anjo (JP403044703). As detailed above with regard to claim 24, Kozicki_A1 disclose

a germanium selenide glass having the formula $(Ge_{x1}Se_{1-x1})_{1-y1}Ag_{y1}$ wherein $18 \leq x_1 \leq 28$ (cf. claim 15 in Kozicki_A1 and section [0060]) and wherein said silver is in a concentration (cf. claim 16) which maintains said germanium selenide glass in the glass-forming region; and

at least two electrodes 120 and 130 in contact with said germanium selenide glass (inert electrode 130 is in direct contact, abutting the ion conductor 140 comprising said germanium selenide glass, while silver electrode 120 is in contact with the ion conductor 140 through silver migration through barrier layer 155 (see section [0047]), said migration being at a reduced level in the OFF state but greatly enhanced in the ON state (see section [0047]), said germanium selenide glass inherently to a certain extent forming a dendrite between at least two electrodes in response to a voltage applied across said at least two electrodes, said dendrite being the inevitable response to the voltage in view of the composition of the ion conductor 140.

*Kozicki_A1 do not necessarily* specifically disclose a processor system comprising a processor, an integrated circuit coupled to said processor, at least one of said processor and integrated circuit including a memory cell of the properties described above as disclosed by Kozicki_A1. However, it is understood in the art of memory devices that the very objective of a memory cell is its incorporation into an integrated circuit wherein the memory contained in said memory cell can be exchange with the outside world through read and write, as evidenced by patents such as the one to Anjo

in which a processor (cf. title) and integrated circuit 10 (cf. abstract) coupled to said processor including said memory cell PCRAM 14 (cf. Abstract).

In the alternative, although Kozicki_A1 do not necessarily specifically disclose said processor system comprising processor, and integrated circuit coupled to said processor including a memory cell, it is obvious and understood in the art that the very purpose of the memory cell by Kozicki_A1 is its use in memory systems, in which the memory cell by necessity is part of an integrated circuit coupled to a processor (cf. section [0003] in Kozicki_A1, in which the background of the invention is discussed in terms of the place of memory devices in integrated circuits and processors).

*With regard to claim 38:* the examiner takes official notice that processors and integrated circuits can be manufactured on the same chip.

*With regard to claims 39-41*: Applicant does not disclose why the selected stoichiometric values are critical to the invention. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

***Conclusion***

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Yamada et al (5,272,667).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P Mondt whose telephone number is 703-306-0531. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 703-308-6601. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

JPM
November 23, 2003